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THE ACQUISITION AND USE OF MORBIDITY DATA IN NAVAL ENVIRONMENTS--ETC(U)
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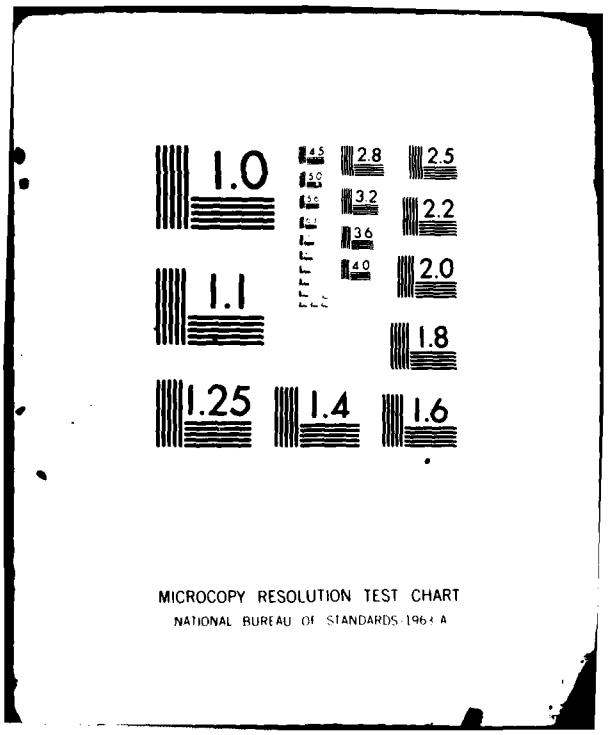
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NAVAL MEDICAL RESEARCH AND DEVELOPMENT COMMAND
BETHESDA, MARYLAND

The Acquisition and Use of Morbidity Data in Naval Environments

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Summary

A system for monitoring medical information in Navy outpatient clinics is currently being developed at the Naval Health Research Center. Within a Navy industrial facility this system is designed to function as a component of an overall system for collecting and storing the information required for occupational health. In clinics outside of an industrial setting this system can operate as a "stand alone" system for capturing medical data. To meet dispensary needs, this system captures all the information necessary for the compilation of both the Medical Services and Outpatient Morbidity Report and the Report of Occupational Health Services and it will automatically print copies of the above reports when they are due. Thus, the medical monitoring system will reduce the administrative burden of the medical department.

When operating as a component of the overall occupational health information system, information can be retrieved from the environmental data base during a medical examination to inform the physician about the hazardous materials present in the patient's workplace. Such data also can be used to have examinations scheduled automatically whenever an individual has had a high level of exposure to a known contaminant. Finally, by having data stored in a readily retrievable form, illness trends can be identified and remedial action taken. Therefore, a highly flexible system capable of alerting physicians about their patient's environmental exposures and automatically generating required management reports is being designed to accommodate a variety of sites ranging from the sick bay of a ship to an industrial complex.

Abstract

One component of the Navy occupational health information system being developed at the Naval Health Research Center is the medical monitoring subsystem. This component was designed to have the capacity to operate on a "stand alone" basis. As an independent system medical data would be gathered, stored, and retrieved to generate routine reports thus relieving medical personnel of some of their administrative burden. However, when operating as a component of the overall occupational health information system reports showing an individual's exposure to hazardous substances can be generated and periodic physical examinations of personnel working with hazardous materials can be automatically scheduled. Thus, a highly flexible system is being developed which can be shaped to meet needs that range from those of a dispensary at a Navy industrial facility to those encountered in the sick bay of a deployed ship.

The Acquisition and Use of Morbidity Data in Naval Environments

Currently a system designed to monitor medical information obtained from Navy ambulatory care clinics is being developed by the Naval Health Research Center. This system evolved as a component of an overall system for documenting information needed for the Navy's occupational health program. The objective of the overall system, called the Navy Occupational Health Information Monitoring System (NOHIMS), is to document environmental conditions and identify hazardous areas, document individual exposures, and to follow patterns of illness and injury. In order to maintain the autonomy of the various activities supplying the required data and to provide the necessary privacy and security for their respective files, a distributed data base configuration was adopted in which two separate subsystems are used to capture the medical and environmental data sets. The design and development of the *medical monitoring subsystem and its function* as a component of the overall NOHIMS will be described in the present paper. The purpose of this discussion is to highlight the flexible nature of the medical monitoring subsystem and to indicate what data will be gathered in different operating environments, why various data elements were selected, and how the information obtained can be used.

An initial step in the development of NOHIMS was the analysis of the functions performed by the various activities contributing to the Navy's occupational health program. A review of the functioning of a Navy dispensary was outlined by following the health care process, starting with the retrieval of the patient's medical record upon his or her entry into the clinic and ending with the patient's departure, whereupon laboratory results and all other information on the patient's physical condition as well as the medical treatment provided is recorded in the patient's medical history file. After the analysis of the functions performed by the various activities related to occupational health, design was begun on the medical monitoring subsystem. As noted earlier, a primary function of NOHIMS was the identification of illness patterns, however, such a goal is somewhat removed from the day-to-day problems of health care providers. Therefore, the medical monitoring subsystem was designed to be more responsive to the dispensaries' immediate needs. One way this was accomplished was to have reports required on a routine basis generated automatically thereby cutting down on the administrative load of the dispensary. By designing the subsystem for capturing medical data to meet the needs of those providing the information, not only are the users motivated to provide quality data, but this approach also helps structure the problem of deciding exactly what data elements should be stored and how.

The reports identified as representing the greatest administrative burden on Navy dispensaries were the monthly Medical Services and Outpatient Morbidity Report (NAVMED 6300/1) and the Report of Occupational Health Services (NAVMED 6260/1). To obtain the data needed to complete these reports a patient encounter form was developed. This form was designed to obtain information throughout a patient visit. Thus, upon entry into the dispensary, each patient receives a form and is asked to enter the date, his or her name, and other identifying information in the space provided at the top of the form. Then as the treatment process proceeds, the health care provider(s) indicate the type of visit (e.g., whether the visit is a new case or a retreatment, occupational or non-occupational, routine or special physical examination, etc.), the patient's complaints, adjunct services provided, causative agents for occupational medical conditions, and the initial and final disposition.

Although the patient encounter form was designed to capture all the information needed to complete the NAVMED 6300/1 and NAVMED 6260/1, many categories were expanded. This is most notable in the list of injuries, illnesses, and symptoms that is provided. For example, rather than using a general category such as "acute respiratory diseases, incl. URI" found on the NAVMED 6300/1, more specific ones were used such as bronchitis, pharyngitis, or tonsillitis. This way in addition to the ability to generate required reports automatically, one can compare the data obtained with data coded according to the ICDA (International Classification of Diseases - Adapted) codes or a variety of other coding systems. Finally, it should be noted that the 104 illness categories used on the patient encounter form were based upon the results of a previous survey conducted at a dispensary serving a Naval Air Rework Facility (Hermansen & Pugh, 1981).

To assess the capacity of the patient encounter form to gather data needed to fulfill administrative requirements, a short-term project was initiated during which data regarding each dispensary visit was recorded on a patient encounter form. These data were keypunched, thereby generating a deck of computer cards which were loaded into a computer disk file. Then desired reports were generated by accessing the information stored on disk and manipulating it electronically. Although the reaction of dispensary personnel to this system was favorable because it was shown that routine reports were readily generated from encounter form data, the demonstration system was too cumbersome for a long-term program.

Rather than starting over from "scratch" in developing an efficient automated medical monitoring system, a review of existing systems was conducted and it was concluded that one system--COSTAR V--could be adapted for NOHIMS. COSTAR V (Computer Stored Ambulatory Record System) was developed at the Massachusetts General Hospital under the auspices of HEW. Basically, it is a software package written in the MUMPS programming language which provides powerful capabilities that were specifically designed for medical records maintenance. COSTAR is designed as a modular system capable of carrying out a variety of functions including patient registration; appointment scheduling; entry, storage, and display of medical data; automatic billing; management reporting; and a built-in maintenance function which allows the system to be tailored to the specific needs of each site (cf. Kerlin & Greene, 1980). To carry out these functions, between 1200 and 1700 program modules are generally needed, depending upon the functions desired and unique site characteristics. Therefore, it is readily apparent that COSTAR is a highly complex medical record-keeping system.

Because the medical monitoring system is only one component of the total NOHIMS, however, certain revisions to the COSTAR program package would greatly enhance the system. For instance, a goal of the overall system is to document the hazards found in employee workspaces. Therefore, incorporating into COSTAR the capability of accessing these data would make it possible to retrieve, during a physical examination, a list of those substances a patient was exposed to while working. Such information combined with a table of hazardous substances that showed for each

substance the threshold limit value (TLV) and organ systems affected could be a valuable aid in guiding the course of a physical examination. In addition, because periodic physical examinations are a critical part of an occupational health program, adding to COSTAR the capability for maintaining a list of the population at risk and the due date for each person's physical exam would make it possible to have examinations scheduled automatically.

The medical monitoring system then functions as a medical recordkeeping system capable of the automatic generation of routine reports when operating on a "stand alone" basis. As such, it could function as a useful tool in a variety of Navy settings including branch clinics in Navy industrial settings or aboard deployed ships. However, as a component of an overall occupational health system (i.e., NOHIMS), additional capabilities are realized such as the automatic scheduling of periodic physical examinations and the provision of exposure information on patient encounter reports. Moreover, a computerized data base of medical and environmental information would greatly facilitate Navy epidemiological research. For example, illness trends could be followed for either an entire population or for any of a variety of subgroups. Or, the association between specific substances and the illnesses incurred by employees in the work areas where those substances are used could be investigated. The results of such studies could be used to anticipate and thus avoid adverse consequences of certain working conditions.

The key feature that makes an automatic recordkeeping system attractive is that information can be rapidly retrieved without disturbing the original record. Thus, individual medical records do not get lost and are available for reference during a patient visit. Moreover, the ability to retrieve selected data points from individual records and rapidly accumulate information across all records greatly facilitates the reporting requirements common to all Navy dispensaries whether they are aboard ship or ashore, thereby making the reports easier to compile, standardized, and more accurate. But possibly the most important advantage offered by the automated system is that it is truly a tool for preventative medicine. By following illnesses, injuries, or test results over time, medical personnel can be alerted at the first sign of a suspicious deviation. This way, preventative action can begin at the *earliest* possible moment. And, in an industrial setting where the medical monitoring system is integrated with other systems, this makes it possible to automatically schedule workers for physical examinations, determine what hazards a worker is exposed to, and assure that appropriate tests are performed during physical examinations. Again, the primary focus is upon preventative medicine--the only real cure for accidents and traumatic injuries.

REFERENCES

Kerlin, B., & Greene, P. COSTAR: An overview and annotated bibliography. The MITRE Corporation, Metrek Division, 1820 Dolley Madison Boulevard, McLean, Virginia 22102, November 1980.

Hermansen, L. & Pugh, W. A system for monitoring employee health in a Navy occupational setting. Naval Health Research Center, Report No. 81-3, 1981.

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